



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,158	07/08/2003	Karim Faïd	PAT 930-2	6471
26123 7590 06/20/2007 BORDEN LADNER GERVAIS LLP WORLD EXCHANGE PLAZA 100 QUEEN STREET SUITE 1100 OTTAWA, ON K1P 1J9 CANADA			EXAMINER LEVKOVICH, NATALIA A	
			ART UNIT 1743	PAPER NUMBER
			MAIL DATE 06/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/614,158

Applicant(s)

FAID ET AL.

Examiner

Natalia Levkovich

Art Unit

1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 22-45 is/are pending in the application.
- 4a) Of the above claim(s) 22-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 30-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-6 and 22-45 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action replaces the Action mailed on 05/16/2007 and sets a new statutory period for reply.
2. Applicant's amendments and remarks dated 03/05/2007 have been acknowledged by the Examiner.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

### ***Claim Rejections - 35 USC § 112***

4. Claims 1-6, 30-35 and 40-45 are rejected under 35 U.S.C. 112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention and for being incomplete for omitting essential steps. See MPEP § 2172.01.

In claim 1, as was earlier discussed, the step of 'reacting the molecular target bound solid support with at least one guest molecule thus forming a solid support stamp having a binding cavity around the molecular target' (step c), is followed by the step of 'applying the solid support stamp to a surface of a solid substrate to attach the binding cavity' (step d). The claim is incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted

steps are those needed to provide the above mentioned attachment of the binding cavity to the substrate (such as, for example, steps related to selecting a substrate material, or coating the substrate surface, or subjecting it to some other pre-treatments, or steps related to setting some process conditions, etc.). The same consideration applies to step (a) of claim 40.

In claim 5, the 'attachment' lacks antecedent basis. It is unclear whether it refers to step (a) or step (d) of claim 1.

### ***Claim Rejections - 35 USC § 103***

5. Claims 1-5 and 30-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yilmaz et al. (US 20040157209) in view of Whitesides et al. (Annu. Rev. Biomed. Eng. 2001. 3:335-73).

Yilmaz et al., as was previously discussed, disclose molecularly imprinted polymers ['detection devices' - Ex.] comprising tailor-made recognition sites for a target made by "polymerising functional monomers ['guest molecules' - Ex.]...in the presence of at least one template ['molecular target' - Ex] immobilised on a support material in a polymerisation process, whereby non-covalent or covalent [bonds] are formed between said functional monomers and said immobilised template(s)', and, finally, by 'removing said template(s), and said support material from the molecularly imprinted polymer' / ['detection devices' - Ex.] - (see Abstract).

Although Yilmaz does teach the obtained molecularly imprinted polymers ['detection devices' - Ex.] being used in 'recognition elements' /sensors (and, therefore, attached

Art Unit: 1743

to some solid substrate), the reference does not specifically disclose the step of applying the stamp to the surface of the solid substrate. However, such microcontact printing (CP) is well known in the art (see, for example, page 341 of Whitesides et al.). Whitesides also teaches at page 337 that, "as the size of devices decreases, their surface-to-volume ratios increase, and their surface properties become increasingly important in determining their performance". It would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the stamp to a solid support in the modified method of Yilmaz, in order to obtain a sensor with improved surface-to-volume characteristics.

With respect to claims 2, 4 and 37, Yilmaz discloses, in paragraph [0004], methacrylic acid and 4-vinylpyridine as an example of functional monomers / 'guest molecules', capable of being used as recognition sites.

As to claims 3 and 38, Yilmaz teaches in [0051] that a " MIP prepared with an immobilized template ['molecular target' – Ex] is used as a nano-cavity ".

In reference to claim 5, Yilmaz does not teach silicon wafers. However, silicon supports are routinely used in manufacture of micro-circuits (see, for example, page 342 of Whitesides et al.). It would have been clearly within the ordinary skill of an artisan at the time the invention was made to have employed silicon wafers in the modified method of Yilmaz as well-proven and commercially available supports with desired chemical and mechanical characteristics needed for particular applications.

In regards to claims 30-32 and 41-43, Yilmaz teaches glass and gold supports in [0018]

With respect to claims 34 and 45, although Yilmaz does not teach the use of two different molecularly imprinted polymers located in different areas of the substrate, it would have been clearly within the ordinary skill of an artisan at the time the invention was made to have employed more than one polymer in the modified method of Yilmaz, in order to maximize the number of tests that can be carried out simultaneously.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yilmaz et al. in view of Whitesides et al., and further in view of Bolshakova et al. (Ultramicroscopy, Volume 86, Issues 1-2, January 2001, Pages 121-128).

Yilmaz does not disclose treating the support with aminosiloxane. However, the use of aminosilanes has become a common technique for covalent linkage of biomolecules to glass in biosensor and DNA chip fabrication. For example, Bolshakova et al. teach silanization of mica (glass) with trialkoxyaminoalkylsilanes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated the solid supports with aminosiloxane, in the modified method of Yilmaz, in order to facilitate immobilization of the template molecules.

### ***Response to Arguments***

7. Applicant's arguments filed on 03/05/2007 have been fully considered but they are not persuasive, or moot in view of new grounds of rejection.

Applicant traverses the 35 U.S.C. 112, second paragraph, rejection of claim 1 stating that there no missing method steps between step (c) and (d) of the instant claim

Art Unit: 1743

1 because 'the attachment of the binding cavity to the solid substrate can be made by any number of ways, with or without modification of the monomers or polymers to attach the binding cavity on the stamp covalently or non-covalently to the solid substrate' and because some examples of the instant disclosure illustrate the attachment being conducted without surface pre-treatment, but, for example, via forming 'surface bonds' between the substrate and thiol groups of the binding cavity, or via 'through covalent or non-covalent interactions' between the cavity and substrate. Examiner agrees that surface pre-treatment is only one of the options available (see the above discussion) and notes that the possibility of forming the bonds mentioned by Applicant with regards to the cited examples is based on a proper selection of substrate materials (or functional groups) and guest molecules which (for this type of the process scenario) would constitute the missing step.

Applicant argues that 'Yilmaz does not specifically disclose the step of applying the obtained stamp to the surface of a solid substrate . Yilmaz neither teaches nor suggests that the contemplated molecularly imprinted polymers can be supported to a substrate' and that this deficiency is not cured by Whitesides . Examiner disagrees. Yilmaz discloses the use of the molecularly imprinted polymers in sensors (that is, supported by a solid element / substrate (see the discussion above) which provides the motivation to develop the step of applying the stamp to the substrate, in view of Whitesides disclosing the micro-contact printing and the miniaturization trends.

Regarding Applicant's arguments about 103(a) rejection of claim 6, examiner maintains that Yilmaz discloses glass substrates and Bolshakova et al. teach

Art Unit: 1743

silanization of mica /glass (see above). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have treated the solid supports with aminosiloxane, in the modified method of Yilmaz, in order to facilitate immobilization of the template molecules.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

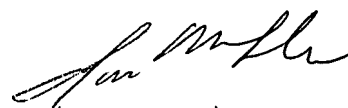
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Levkovich whose telephone number is 571-272-2462. The examiner can normally be reached on Mon-Fri, 8 a.m.-4p.m..



Art Unit: 1743

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
JAN LUDLOW  
PRIMARY EXAMINER